

CLAIMS

WHAT IS CLAIMED IS:

1. A bearing device for internal combustion engines, comprising a crankshaft and a bearing supporting the crankshaft in an internal combustion engine, and

wherein the crankshaft is made of steel having not been subjected to surface hardening and having a structure, which is mainly composed of pearlite having the pro-eutectoid ferrite fraction of at most 3 %, and is processed to have the surface roughness Rz of at most 0.8 μm , and

wherein the bearing has an aluminum bearing alloy bonded to a back plate thereof and contain, as an alloy component thereof, Si particles of less than 4 mass %.

2. The bearing device according to claim 1, wherein Si particles of the aluminum bearing alloy having the particle diameter of at most 4 μm have the area ratio of at least 60 % relative to a total area of Si particles present on a sliding surface.

3. The bearing device according to claim 1, wherein the aluminum bearing alloy has a Vickers hardness of at most 70.

4. The bearing device according to claim 2, wherein the aluminum bearing alloy has a Vickers hardness of at most 70.

5. The bearing device according to claim 1, wherein the aluminum bearing alloy has a Vickers hardness to meet the following formula

$$B \leq (S/2 - 70)$$
 (B: Vickers hardness of the aluminum bearing alloy, S: Vickers hardness of the crankshaft).

6. The bearing device according to claim 2, wherein the aluminum bearing alloy has a Vickers hardness to meet the following formula

$B \leq (S/2 - 70)$ (B: Vickers hardness of the aluminum bearing alloy, S: Vickers hardness of the crankshaft).

7. The bearing device according to claim 3, wherein the aluminum bearing alloy has a Vickers hardness to meet the following formula

$B \leq (S/2 - 70)$ (B: Vickers hardness of the aluminum bearing alloy, S: Vickers hardness of the crankshaft).

8. The bearing device according to claim 4, wherein the aluminum bearing alloy has a Vickers hardness to meet the following formula

$B \leq (S/2 - 70)$ (B: Vickers hardness of the aluminum bearing alloy, S: Vickers hardness of the crankshaft).

9. The bearing device according to claim 1, wherein a softer conforming layer than the aluminum bearing alloy covers surfaces of the alloy.

10. The bearing device according to claim 2, wherein a softer conforming layer than the aluminum bearing alloy covers surfaces of the alloy.

11. The bearing device according to claim 3, wherein a softer conforming layer than the aluminum bearing alloy covers surfaces of the alloy.

12. The bearing device according to claim 4, wherein a softer conforming layer than the aluminum bearing alloy covers surfaces of the alloy.

13. The bearing device according to claim 5, wherein a softer conforming layer than the aluminum bearing alloy covers surfaces of the alloy.

14. The bearing device according to claim 6, wherein a softer conforming layer than the aluminum bearing alloy covers surfaces of the alloy.

15. The bearing device according to claim 7, wherein a softer conforming layer than the aluminum bearing alloy covers surfaces of the alloy.

16. The bearing device according to claim 8, wherein a softer conforming layer than the aluminum bearing alloy covers surfaces of the alloy.

17. The bearing device according to claim 9, wherein the conforming layer is formed by plating or resin coating.

18. The bearing device according to claim 10, wherein the conforming layer is formed by plating or resin coating.

19. The bearing device according to claim 11, wherein the conforming layer is formed by plating or resin coating.

20. The bearing device according to claim 13, wherein the conforming layer is formed by plating or resin coating.